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Summary Report on Technology Transfer to Communist Countries and the Intelligence Community's Role and Effectiveness

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October 1981

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Submitted by the Director of Central Intelligence to the Senate Select Committee on Intelligence

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TTIC 81-001
October 1981

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The Honorable Barry Goldwater
Chairman
Senate Select Committee on Intelligence
United States Senate
Washington, D.C. 20515

Dear Mr. Chairman:

During several appearances before your committee by Admiral Inman and myself earlier this year, we discussed the problem of US and Western technology losses to Communist countries, and the need to do something about these losses. Your concern centered on three key questions:

- What is the role of the Intelligence Community in controlling technology transfer and how effective has the Community been in helping to prevent the loss of sensitive technology related to US national security?
- What are the nature and extent of US and Western losses and the benefits to the Communist countries acquiring our technology?
- What improvements would enhance the Community's capabilities to assist the appropriate agencies in protecting US and Western technology? [redacted] 25X1

I share your concern and am pleased to present to you this summary report in response to your three questions. Detailed backup material upon which this report is based is available for your review. This report focuses principally on losses of US (and Free World) technology to the USSR and Eastern Europe. A special section (appendix) was prepared on China but should be viewed in the context of the changing US policy regarding China. [redacted] 25X1

It is my conclusion, based on this report, that the concerns of the Senate Select Committee on Intelligence are well founded. The Soviets and East Europeans have for some time been trying to obtain the most sophisticated US and Western technology, to satisfy both military and economic needs, through all means at their disposal and with many notable successes. A variety of transfer mechanisms have been used, including lawful purchases and trade arrangements; short- and long-term visits to the United States by scientists, students, and trade representatives; unlawful diversions of materials from approved destinations abroad; and clandestine intelligence operations. The result has been the strengthening of the Soviet and East European industrial and military sectors, accompanied by a difficult-to-measure, but identifiable, reduction in the security posture of the United States and its Western allies [redacted] 25X1

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Although the Intelligence Community (IC) has only had a marginal role in US programs that regulate technology transfer, it has provided intelligence support to those departments and agencies that have sought it; however, those departments and agencies for various reasons have not been able to make the best use of the available IC support. The only specific statutory responsibility of the intelligence agencies is limited to assisting Commerce in determining the foreign availability of controlled US technology. The enforcement responsibilities for export control statutes are assigned to the Departments of Commerce, State, and Treasury. Only the FBI, among the Intelligence Community organizations, becomes involved in the prevention of US technology losses in an enforcement sense and that mainly as the result of the Bureau's foreign counterintelligence and other criminal investigations. The Intelligence Community performs many support and ad hoc functions in this area, but its primary role consists of the collection, analysis, production, and dissemination of foreign intelligence concerning Soviet and East European needs for, methods of, successes in, and benefits from acquisitions of US and Western technology. Given this very limited role, the Intelligence Community can do little by itself to improve the protection given to US and Western technology. Direct improvement is limited to increasing the efficiency and timeliness of the intelligence and counterintelligence efforts in this area. [redacted] 25X1

Since assuming the Directorship of Central Intelligence, I have initiated several actions that address the most serious IC-related problems identified in this report, including:

- Charging the Deputy Director of Central Intelligence for Foreign Assessment (DD/NFA) with enhancing the Intelligence Community's overall capability to support both national policymakers and the US Export Control Community's decisionmakers.

- Establishing a Technology Transfer Assessment Center within CIA.

- Developing an offensive counterintelligence program to counter hostile intelligence service efforts to acquire US technology abroad.

- Assigning the technology transfer issue to my Critical Collection Problems Committee for increased focus by collectors.

- Establishing a DCI Committee that incorporates my Committee on Exchanges (COMEX) to deal with all forms of US and Western technology transfer; this Technology Transfer Intelligence Committee is to ensure that optimum use is made of IC resources on this problem and that the IC's support of the Export Control Community is responsive and properly coordinated. [redacted] 25X1

[redacted] 25X1

I would also like to call to your attention several important efforts that have been undertaken recently by elements of the Intelligence Community to improve intelligence support to export control policy and decision-making:

- The Defense Intelligence Agency now ensures that the military implications of technology transfers are factored into all appropriate DOD foreign weapon systems studies and that foreign technology availability assessments are being conducted in support of the Military Critical Technology List program levied on DOD by the Export Administration Act.

- The intelligence components of Commerce and Treasury, with the assistance of NSA and CIA, have taken the initiative to define their intelligence needs more precisely, and as a result the flow of relevant foreign intelligence for use in their export control efforts has increased.

[redacted] 25X1

Several important problems remain to be addressed by the IC, but I intend to pursue them vigorously with all the resources I have available. Furthermore, I have asked Admiral Inman to conduct a review of the IC's current resource capability to address the remaining problems, and we will take appropriate steps to ameliorate those that are not adequately covered. [redacted] 25X1

The review conducted in preparing this report also identified a number of other important problems that affect US technology losses to the Communist countries but that are beyond the Intelligence Community's area of responsibility. These problems are identified in section III of the report. I am prepared to work with you and the appropriate departments and agencies to stop these illegal, unauthorized, or unintentional transfers of US technology. [redacted] 25X1

Sincerely,

William J. Casey

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Summary Report
on
Technology Transfer to Communist Countries
and
the Intelligence Community's
Role and Effectiveness

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October 1981

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Preface

This report addresses three questions expressed by members of the Senate Select Committee on Intelligence concerning technology transfer to Communist countries: 1) What is the Intelligence Community's role; 2) What is the nature and extent of Western technology loss; and 3) What steps might be taken by the IC to improve the Community's role in helping to stop such losses? [redacted] 25X1

The transfer of Western technology to Communist countries continues to be one of the most complex issues facing our government. The prevention of US technology loss is particularly complicated because it not only involves activities that are spread throughout the US Government, but also requires the active cooperation of foreign governments. In addition, the prevention and protective measures that can be taken by the US Government include such complex and diverse elements as US foreign trade policy and domestic and international export controls; domestic and foreign law enforcement and counterintelligence activities; and export control licensing requirements and the control of both unclassified and classified national defense information. The role of the Intelligence Community in this area has been poorly defined and other than the traditional responsibilities of collection, analysis, and the production of finished intelligence on East-West technology transfers, the Community has provided only support that has been directly requested. In the past, the IC considered this responsibility to be a secondary priority, at best. [redacted] 25X1

This report addresses the technology transfer loss problem and its national security implications. The term technology transfer connotes a wide range of trade, scientific, industrial, and communications activities; there is no single definition. When viewed in the context of technology loss the means of transfer becomes a greatly enlarged set, ranging from open source publications to war losses and traditional espionage. Transfer mechanisms that would not be considered cost-effective in commercial transfers, such as reverse engineering an illegally acquired missile component, become useful means to military adversaries who otherwise would be denied such technology. "Technology transfer" as used in this report means the conveyance of technical knowledge by legal or illegal means, including technical journals and memorandums, blueprints, technical proposals, official and personal conversations and plant tours, manufacturing equipment, whole plants, and end products. [redacted] 25X1

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This report was prepared by the Central Intelligence Agency, the Defense Intelligence Agency, the Federal Bureau of Investigation, the National Security Agency, the Department of Energy, the DCI's Committee on Exchanges (COMEX), and the DCI's Community Counterintelligence Staff. It was reviewed and coordinated by the intelligence components of the Departments of Commerce, State, and Treasury. The report was reviewed and concurred in by the National Foreign Intelligence Council on October 13, 1981.

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Contents

Technology Transfer and the Role of the Intelligence Community

The Problem

The Intelligence Community (IC) shares the committee's concern regarding the transfer of Western technology that benefits the defense efforts of Communist countries. Our intelligence indicates that the Soviets and their Warsaw Pact allies have acquired large amounts of such US and Western technology and equipment through legal and illegal means, including their intelligence services. The Soviets have tried and succeeded in acquiring the most advanced Western technology. They have used their scientific and technological agreements with the West to facilitate access to the new technologies that are emerging from our applied scientific research efforts. They have used their scarce hard currency to legally purchase uncontrolled advanced Western technologies having defense-industrial applications. And, they have used their intelligence services to acquire those US technologies that are classified and export controlled. [redacted] 25X1

The Soviets and their Warsaw Pact allies have acquired militarily significant US technology through all possible technology transfer channels. Their effort to acquire US and Western technology is well planned and managed, its primary objective being to support Soviet and Warsaw Pact defense programs and to selectively fill gaps in their industrial base. Our intelligence indicates that this effort has been quite successful. Tables of selected US and Western technology and equipment acquired by the Soviets can be found in the tabular appendix to this report. [redacted] 25X1

Over the last decade the KGB,[1] the GRU,[2] and the East European Intelligence Services have acquired key military technologies, such as US ballistic missile guidance components and designs; sonar and related antisubmarine warfare (ASW) technology; tank and antiarmor technologies; and wide varieties of missile and aerodynamic weapons technologies from the United States and its NATO allies. They have also been able to acquire large quantities of controlled technology such as semiconductor design and manufacturing equipment from the United States and other Western nations; [redacted] 25

[1] The Soviet Committee for State Security. (U)

[2] The Chief Intelligence Directorate of the Soviet General Staff. (U)

[redacted] 25X1

Similarly, Soviet and East European intelligence service acquisitions of US computer technology have been responsible for many of their advances in general purpose and minicomputers. [redacted] 25X1

The Intelligence Community has concentrated its efforts over the last several years in determining the nature and extent of Western technology losses; the supplementary appendix is only a partial listing of some of the more significant items. We have only recently begun to focus our analytical efforts on assessing the military value of these technology losses to the Soviets and their Warsaw Pact allies. Although our intelligence concerning actual Soviet use of acquired Western equipment and technology is limited, we do know that the Soviets value Western technology quite highly. Soviet sources have stated that the acquisition of Western technology and equipment has saved the Soviets' defense production ministries millions of dollars in R&D funds, not to mention the developmental time it has saved. The Soviets' need to reduce Warsaw Pact military production costs is cited as one of the primary reasons for acquiring advanced Western production-related technology. Our intelligence sources also have cited the innovative effect of Western technology on Soviet industry as another reason for its acquisition and use. For example, we believe the extensive effort to acquire US-controlled semiconductor production equipment is an effort to modernize the whole Soviet electronic component industry, a key sector in the Soviet defense industry. [redacted] 25X1

Direct military applications of Western technology are hard to confirm, but we believe that most Western technology acquired by Soviet and East European intelligence services is used in some fashion by defense industry designers and manufacturers. We believe that such technology, which is usually acquired in response to specific requirements, is used directly or indirectly in both military R&D and countermeasure development.

While it was Soviet practice in the 1950s and 1960s to copy Western military technology and in some cases entire weapon systems (for example, the Sidewinder air-to-air missile, which became their ATOLL missile), their present inclination is to be far more discriminating, evaluating the foreign technology carefully and choosing only those design elements and engineering approaches that best fit their military needs and industrial capabilities. More and more, Western technology is needed only on a selective basis to upgrade key subsystems to achieve new performance objectives. The acquisition and copying of US inertial guidance components, for example, is believed to have helped the Soviets in achieving their

current ballistic missile accuracy. Soviet antisubmarine warfare (ASW) capabilities have been significantly upgraded as a result of illegal acquisitions of Western equipment and technology, and Soviet tanks have profited from acquired Western technology. To date we have not been able to assess the military and industrial implications of many known Soviet technology acquisitions: we plan to, as time and resources permit, in the future. [redacted] 25X1 25X1

[redacted]

The Role of the Intelligence Community

The role of the Intelligence Community concerning unauthorized and illegal transfers of US technology to Communist countries includes the following: [3]

1. Collecting information on and monitoring the transfer of controlled technology to foreign countries and disseminating relevant intelligence to the appropriate US export control agencies.
2. Producing finished intelligence on the military, economic, and political implications of actual and proposed technology transfers to controlled-country destinations.
3. Providing support to the NSC and high-level policy and decisionmaking organizations within the US export control community—that is, Commerce, State, Treasury, Energy, Defense, and the several interagency bodies that exist.
4. Providing intelligence support—as requested—to US Departments and Agencies (Commerce, State, Treasury, and Energy) that are responsible for administering export controls.
5. Disseminating that foreign intelligence information concerning possible violations of US export control statutes to the Department of Justice and to the appropriate investigative and enforcement agencies.
6. Disseminating intelligence and foreign counterintelligence information to the National Disclosure Policy Committee to aid in making decisions concerning the release of US classified military information and material to eligible foreign nations.

[3] The IC's responsibilities concerning the loss of US technology are derived from a number of executive policy and decision memorandums as well as executive orders, including Executive Order 12036 and related Attorney General Guidelines concerning the reporting of possible export control violations, Presidential Review Memorandum (PRM-) 31 and its NSC Decision Memorandum, and NSC 953 establishing the Interagency Working Group on Export Control. Specific statutory responsibilities, however, are limited to the foreign availability responsibilities cited in the Export Administration Act of 1979 and to the Espionage Statutes. (U)

7. Providing current reporting and analysis of foreign intelligence on illegal, including clandestine, acquisitions of US technology to those export control organizations responsible for domestic and foreign compliance actions.
8. Using foreign counterintelligence operations, as appropriate, to prevent US technology losses involving hostile intelligence services.

Table 1 lists the principal responsibilities of the Community and identifies the support of the IC organizations that perform them. 25X1

The FBI is the primary member of the Intelligence Community with law enforcement responsibilities related to technology losses, but it has no statutory responsibility for enforcing the Export Administration Act or the Arms Export Control Act. The enforcement responsibilities for these statutes are assigned to the Department of Commerce (Export Administration Act) and the Department of State (Arms Export Control Act); these Departments call on the Customs Service for inspection and investigation assistance. The FBI does become involved in the prevention of US technology losses, however, when such losses are encountered in the course of its foreign counterintelligence investigations and in the course of its enforcement of espionage, foreign agent registration, and other criminal statutes. Other members of the IC (CIA and the military services) also conduct counterintelligence investigations which relate to US technology losses. 25X1

Although the IC has very limited responsibilities concerning the prevention of technology losses, its normal collection, analysis, and intelligence-production efforts regularly result in the production of foreign intelligence useful to the export control policy and enforcement agencies. These efforts have been of some assistance in strengthening US Government enforcement of national security export controls, in preventing potential unauthorized and illegal transfers, and in avoiding potential technology losses. 25X1

The IC supports US export controls by providing timely reporting and analysis to those government agencies and interagency working groups concerned with domestic and international compliance. With respect to domestic efforts, the IC provides foreign intelligence support to the Commerce Department's Office of Export Administration compliance

effort and to the Customs Service through regular dissemination of unevaluated intelligence, as well as through analytical support on particular export cases, as requested. The IC also participates in the new Interagency Working Group on Export Control, chaired by the Department of Justice, which is responsible for the oversight and coordination of domestic enforcement activities of the US Government. 25X1

Similarly, the IC provides analytic and advisory support to the US Government's international monitoring and enforcement efforts through the Economic Defense Advisory Committee's (EDAC) Working Group II (WGII). This group is responsible for coordinating US Government positions on illegal diversions and enforcement issues involving negotiations bilaterally with other governments and multilaterally in the Coordinating Committee (CoCom).[4] 25X1

The DCI's Committee on Exchanges (COMEX) coordinates IC efforts concerning official US Government exchanges and bilateral cooperative agreements, as well as commercial visits and related activities, with the USSR, China, and East European countries. COMEX advises the State Department and other agencies involved regarding possible science and technology gains and losses and the potential intelligence benefits to the United States of proposed, ongoing, or contemplated exchange programs. The committee advises State and others regarding ways that visits might be constrained in order to reduce the potential for adverse technology transfer. Under US national security export control regulations, the release of technical data to foreign visitors may be a form of export. When the program of a prospective visitor might require review by licensing authorities in Munitions Control or Commerce, these agencies are so advised. 25X1

At the present time the responsibilities and activities cited above are diffused throughout the Intelligence Community, and there is no central focus within the IC for overseeing and coordinating their execution. 25X1

[4] Composed of the following countries: the United States, United Kingdom, France, Italy, the Netherlands, Belgium, Luxembourg, Norway, Denmark, Canada, Federal Republic of Germany, Portugal, Japan, Greece, and Turkey. (U)

The Technology Loss Problem

The Nature of the Losses

The USSR has traditionally given high priority and devoted large amounts of resources to the acquisition of US and Western technology by all means at its disposal. The efforts include legal acquisitions through legitimate trade, scientific and technological exchanges, open source publications, and international organizations and conferences; illegal purchases and trade activities, including diversions through trade channels that evade US export control, as well as traditional clandestine acquisitions through recruited agents, industrial espionage, and communications intercepts. Table 2 provides a general view of some of the many technology transfer mechanisms that must be monitored to detect illegal and unauthorized transfers. The table also identifies some of the control mechanisms that help stem our technology losses [redacted] 25X1

Among the many sources of Western technology accessible to the Soviets, the acquisitions that have the most immediate impact on Soviet military development have resulted from clandestine collection and trade diversions of defense-related technology. The most significant Soviet military acquisitions have been weapon designs, manufacturing plans and drawings, critical components, subsystems, and some complete weapon systems. The Soviets also have profited from the exploitation of captured Western military equipment (as in Vietnam). [redacted] 25X1

The Soviet clandestine collection program is approved at the highest levels of the government—that is, the Central Committee of the Communist Party and the Council of Ministers. These illegal acquisition efforts are driven first by the needs of the military, the defense industrial ministries, as voiced through the Military-Industrial Commission (VPK); and, secondly, by the needs of the civilian sectors of Soviet industry that support defense production. The technology acquisition efforts of the Soviet intelligence services are worldwide, centrally directed, and very selective. They are closely coordinated with overt acquisitions and legitimate purchases, particularly those efforts under the auspices of the State Committees for Science and Technology (GKNT). The USSR's acquisition efforts are extensively supported by the other members of the Warsaw Pact. [redacted] 25X1 25X1

The Soviets and their Warsaw Pact allies also have acquired—mainly through illegal trade means—export controlled dual-use and defense-related production equipment. Over the last five years, Soviet illegal trade efforts have concentrated on computers, microelectronics, airbreathing propulsion technology, guidance and navigation systems, acoustic sensors, optical technologies (including lasers), and modern production equipment

Table 2

Selected Technology Transfer Mechanisms and Controls

Mechanisms [a]
- Direct investment
- Complete (turnkey) plant sales
- Patents and licenses with extensive teaching effort
- Joint ventures and joint production development
- Technical exchanges with ongoing contact
- "Know-how"—training, consulting in high-technology areas
- Processing equipment (with know-how)
- Technical data and engineering documents
- Proposals, presale negotiations, and sales presentations
- Commercial visits
- Governmental- and industrial-equipment sales
- Sales of products
- S&T and student exchanges
- Open literature (journals, magazines, technical articles, for example)
- S&T conferences, trade shows, and exhibits
- Hostile intelligence service acquisitions
- Recruited agents and industrial espionage
- Illegal arms trade
- Illegal trade
- End-user diversions
- Third-country diversions
- Foreign SIGINT
- Capture in war

Controls
- Export controls (national and international)
- Government security and regulations
- Industrial security
- Company management
- Visitor control (governmental and industrial)
- Prerelease reviews of open literature

[a] All transfer mechanisms can be employed with or without the participation of hostile intelligence service personnel. The involvement of such personnel can range from the overt, legal collection of unclassified, unembargoed technology to the clandestine acquisition of classified, military technology by agents working pursuant to the direction of hostile intelligence service personnel. Furthermore, most of the transfer mechanisms can be legally or illegally employed. Some of the mechanisms, such as capture in war, make the concept of legality moot.

This table is Unclassified.

and technology. Detected diversions and evasions over the last several years were particularly heavy in the field of semiconductor manufacturing equipment, and they indicate Soviet and East European efforts to improve their whole electronic components industrial sector.

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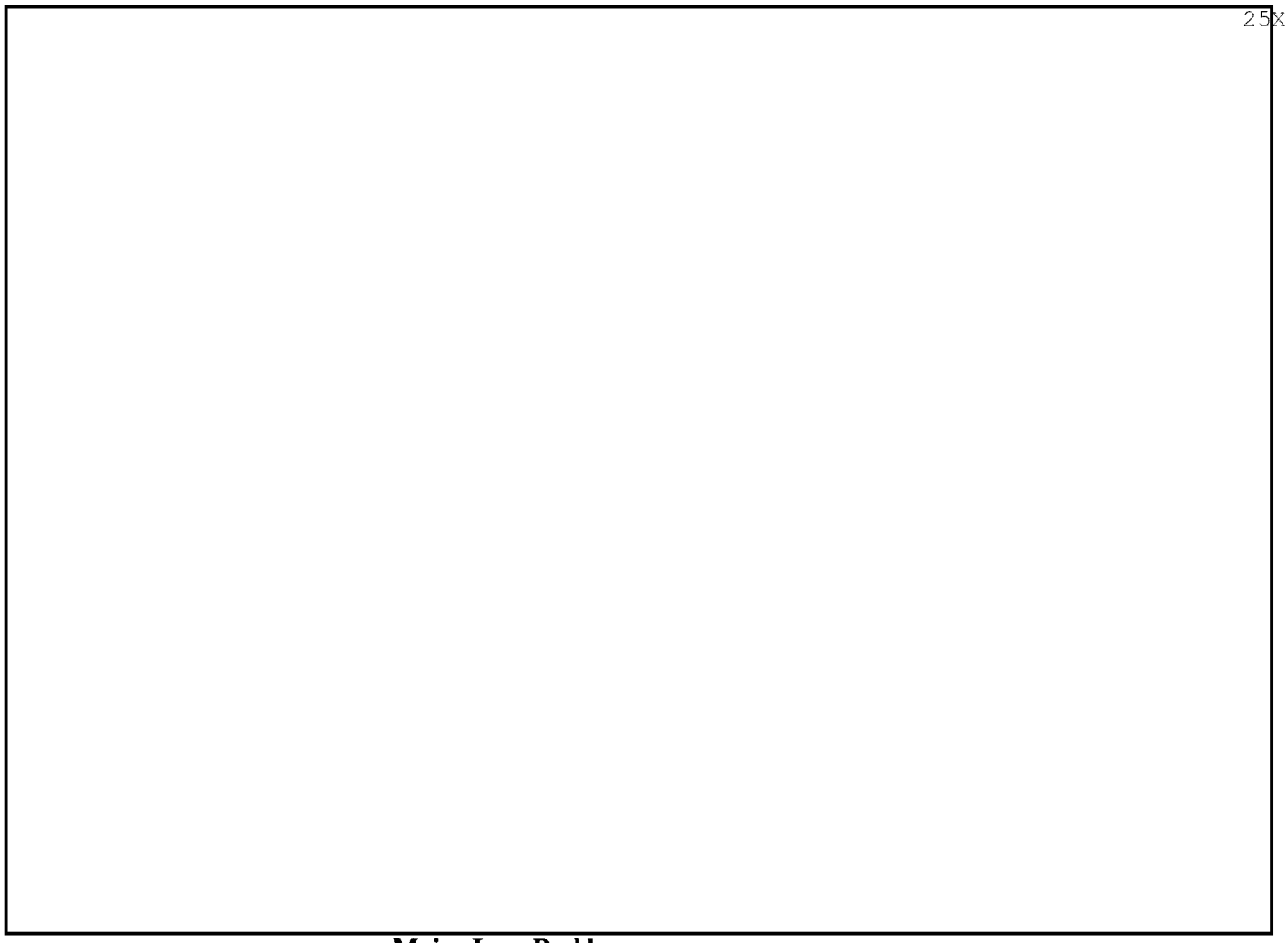

Major Loss Problems

The USSR and its Warsaw Pact allies are acquiring militarily critical and other significant Western technology through almost all possible technology transfer mechanisms. Because of their well-planned and exhaustive technology acquisition effort, the Soviets are able to fully exploit the open and legal sources available in the West at minimal cost and risk before employing their intelligence services to acquire the more difficult export controlled and classified technologies they need for defense purposes. We have identified below some of the most serious technology transfer problems currently facing the United States and its allies. 25X1

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